JKAU: Islamic Econ., **Vol. 1**, pp. 39-57 (1409 A.H./1989 A.D.)

The Financial System and Monetary Policy in an Islamic Economy

MOHSIN S. KHAN and ABBAS MIRAKHOR
Assistant Director, and Economist
Research Department, International Monetary Fund,
*Washington, D. C.**

ABSTRACT. The main characteristics of an Islamic financial system are described relying on recent writings on the subject and on the actual practice of Islamic banking. A theoretical model of an Islamic economic system is developed by generalizing the standard IS-LM model in order to study the effects of monetary policy on the macro-economic variables of an Islamic economy. Whether the authorities attempt to influence monetary conditions through changing the money supply or use the flow of *Mudarabah* financing as an intermediate objective, there would be no fundamental change in the way monetary policy affects economic variables. An expansionary monetary policy would reduce rates of return and increase output.

I

The central feature of an Islamic financial system is the absolute prohibition of the payment and receipt of interest. Thus, countries that have chosen to bring their economic systems into closer accordance with the rules prescribed by Islamic law have had to restructure their banking Systems to conform with the restriction on interest-based financial transactions. As Islamic law, while rejecting the concept of a predetermined interest rate, permits an uncertain rate of return based on trade and profits, banks in an Islamic economy can strictly operate only on some type of profit and loss sharing basis(1). Such arrangements for the conduct of financial transactions have been adopted in the Islamic Republic of Iran, Pakistan, and to a limited extent in other Islamic countries(2).

* We are grateful to Nadeem Ul Haqueq, Peter Montiel, and to two anonymous referees for helpful comments on an earlier version of this paper.
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In broad terms, an Islamic banking system is essentially an equity-based system in which depositors are treated as if they were shareholders of the bank. Consequently, depositors are not guaranteed the nominal value, or a predetermined rate of return, on their deposits. If the bank makes profits then the shareholder (depositor) would be entitled to receive a certain proportion of these profits. On the other hand, if the bank incurs losses the depositor is expected to share in these as well, and receive a negative rate of return. Thus, from the depositor's perspective an Islamic commercial bank is in most respects identical to a mutual fund or investment trust, Further more, to remain consistent with Islamic law, the bank cannot charge interest in its lending operations, but has to use special modes of investment and financing that are also based on the concept of profit and loss sharing.

The implementation of an equity-based financial system in which any type of fixed rate of return on transactions is excluded raises a number of complex issues. First, it is necessary to develop alternative financial instruments that do not have a fixed nominal value and bear a predetermined rate of interest. There are in fact a number of such alternatives proposed by Islamic scholars that satisfy such requirements. Second, there is the question of how monetary policy would be expected to operate in an interest-free economy. This is, of course, an issue of immediate relevance for the policy makers in Islamic countries. Obviously, instruments of monetary policy that rely in any way on the rate of interest would be removed from the arsenal of the authorities, and suitable substitutes would have to be found if monetary policy is to continue to play a role in Islamic economies.

Much of the literature on Islamic banking has focused on the creation and development of financial instruments that are regarded as permissible under Islamic law[(3)], The conduct of monetary policy in an Islamic economy has also been addressed recently in a number of papers[(4)]. The studies on monetary policy contain, in varying detail, descriptions of the instruments that the authorities could employ to change the quantity and rates of return on financial claims in the economy. Even though the use of the discount rate and open market operations with interest-bearing securities are precluded, there are a number of policy instruments available for controlling domestic liquidity. These include, for example, changes in reserve requirements, overall and selective controls on credit flows, changes in the monetary base through management of currency issue, and moral suasion. Furthermore, as pointed out by Akram Khan (1982) and Siddiqi (1982), open market operations could still be conducted with securities that do not bear a fixed rate of return. The monetary authorities also have the possibility of directly changing the rates of return on both deposits and loans by altering the ratios in which the banks and the public are expected to share in the profits and losses that are associated with the transactions, i.e., the profit-sharing ratios. However, this is still a somewhat controversial issue as there are certain scholars who believe it would be inappropriate for the central bank to unilaterally change a contractually-determined ratio. At the same time, other writers have argued in favor of regulating profit sharing ratios to achieve the goal of monetary stability, provided such actions affect only new deposits and not existing ones[(5)].

While the existing studies provide a very useful inventory of the financial instruments that could substitute for interest-based instruments, they do not analyze how these would actually operate in an Islamic environment, Indeed, there is surprisingly little work of a formal nature on the financial system and the general role of monetary policy in an Islamic economy. The purpose of this paper is to describe first the main characteristics of an Islamic financial system. This part of the study relies on both the recent writings on the subject as well as the actual practice of Islamic banking in countries such as Iran and Pakistan. This description of the institutional framework sets the stage for the development of a simple theoretical model of the Islamic economic system. This model, while highly stylized, is nevertheless able to address some of the main issues of concern to the monetary authorities in Islamic countries. These issues include, in particular, the relationship between the instruments that a central bank in an Islamic economy has at its disposal and overall financial conditions in the economy, and the effects of monetary changes on macroeconomic variables. The focus in this paper will be primarily on determining whether such relationships are fundamentally altered when a country decides to move from a conventional financial system to an Islamic one.

In Section II we describe the financial structure in an Islamic economy, paying particular attention to the types of transactions that would replace interest-rate transactions. The model that is based on this institutional structure is discussed in Section III. The concluding section brings together the main results of the paper, points out some of the limitations of the analysis, and finally, suggests areas where further research is needed to assist policy making in Islamic countries.

II
Institutional Characteristics of an Islamic Banking System

The explicit injunction against the payment of interest implies that banks in an Islamic economy are denied conventional sources of funds, such as interest-bearing deposits, and cannot undertake lending operations on the basis of predetermined rates of return. In the Islamic system savings are mobilized through direct participation of savers in entrepreneurial activities, including banking, and surplus funds are loaned out in various forms of (religiously) approved transactions. This section describes the methods that have evolved to enable banks to continue to serve as intermediaries between savers and investors, while at the same time remaining consistent with the guidelines of Islam.

We start by considering the liability side of the balance sheet of banks, and then turn to the asset side where we discuss in somewhat more detail the approved modes of lending and financing.

1. Sources or funds

Besides their own capital and equity, the main sources of funds for Islamic banks would be two forms of deposits - transaction deposits and investment deposits.

a. Transaction deposits

As the name suggests, such deposits are directly related to transactions and payments, and can be regarded as corresponding to demand deposits in conventional banking systems. Although a bank would guarantee the nominal value of the deposit, it would pay no interest on this type of liability. Banks would be expected to provide a variety of services to the holders of transaction deposits, the most important of which are checking facilities(6). Generally speaking, funds mobilized through this source cannot be used for profitable investment by banks. As such, banks would presumably have to levy a service charge on deposit holders to cover the costs of administering this type of account.

It has been argued that transaction deposits should have a 100 percent reserve requirement placed on them, with the backing being in the form of currency, foreign exchange, or suitable government securities(7). Obviously with a 100 percent reserve requirement the nominal value of these deposits would be automatically guaranteed. Aside from satisfying the desires of risk-averse individuals for a complete safe financial asset, this reserve requirement would also prevent the possibility of a banking crisis from interfering with the payments mechanism(8).

b. Investment deposits

The principal source of funds for banks would be deposits that more closely resemble shares in a firm, rather than time and savings deposits of the customary sort. The bank offering investment deposits would provide no guarantee on their nominal value, and they would not pay a fixed rate of return. The depositor instead would be treated as if he were a shareholder in the bank and therefore entitled to a share of the profits made by the bank. If the bank's operations resulted in an overall loss, such losses would also be shared by the depositor (and the bank) and the nominal value of the deposit would be written down. Unlike in conventional banking systems where the depositor is guaranteed the nominal value of his deposit, either by the bank or by the government through explicit or implicit deposit insurance(9), the only contractual agreement between the depositor and the bank is the proportion in which profits and losses are to be distributed. This profit sharing ratio has to be agreed in advance of the transaction between the bank and the depositor, and cannot be altered during the life of the contract, except by mutual consent.

While there are no firm rules on how the profit sharing would be determined, the basis of distribution would be presumably the overall profit and loss position of banks. Distributable profits would be calculated by setting off administrative expenses, provisions for taxes and reserves, and payments due to the central bank and other banks in respect of the financing provided by them, from total profits. The resulting net profits would be divided between the shareholders of the banks and the holders of investment deposits using a formula that takes into account the relative contributions of capital and equity, and investment deposits, to the profitability of the bank(10). There are, however, two crucial differences between investment deposits and common stock of the bank. First, deposit holders would not typically have any say in the management of the bank, and second, dividends on common stock would be discretionary on the part of bank management, whereas investment deposits would always yield a constant proportion of profits(11).

Of course, in the absence of a single, or representative, interest rate there would be an increase in the information costs to those wishing to place funds in investment deposits. Individuals would have to evaluate the relative performances of various banks in order to decide where to invest, instead of simply going into time and savings deposits with a known interest rate. However, the information costs can be significantly reduced if there is a secondary market in which investment deposit certificates are traded. This market would provide the necessary signals to the public on the current and expected performance of banks through the pricing of these investment deposit certificates.

As shown in a recent paper by Khan (1986), this system of investment deposits is quite closely related to proposals aimed at transforming the traditional banking system into an equity basis made frequently in a number of countries, including the United States(12). Since the nominal value of investment deposits is not guaranteed and will fluctuate according to the performance of the bank, any shocks to asset positions are absorbed by changes in the value of shares (deposits) held by the public. Therefore, an equity-based system of this type can respond more easily and rapidly in the face of a banking crisis. In the traditional banking system the bank is expected to guarantee the nominal value of the deposit, and a shock can cause a divergence between the real value of assets and liabilities. If the bank cannot absorb losses through its reserves and borrowings from the central bank, this divergence may well result in instability and possible collapse of the payments mechanism. With the value of deposits directly linked to the earnings, and therefore assets, of banks, such a possibility is excluded from the Islamic banking system(13).

2. Lending operations or banks

Unlike the equity-participation schemes advocated by Simons (1945) and others, which focus exclusively on the liability side of the balance sheets of banks, Islamic banks have also to apply the same principles of profit and loss sharing in their loan operations. The two methods that fully satisfy the requirements of Islamic law on the lending side are *Mudarabah* and *Musharakah* arrangements(14). Both these forms are essentially variants of partnership agreements in which risk and return are shared by the parties.

a. Mudarabah financing

In general terms, in this transaction surplus funds are made available by the owner to the entrepreneur to be invested in a productive economic activity in return for a predetermined percentage of the profits earned. During the lifetime of the project the lender is the sole owner of the project and the borrower is the manager. Profits are to be shared between the lender and the borrower, but in contrast to the case of investment deposits, there is an asymmetry insofar as losses are concerned, In a *Mudarabah* arrangement of financial losses have to be borne exclusively by the lender. The borrower, as such, loses only the time and effort invested in the venture(15).

In practice, under *Mudarabah* rules banks would provide loans to business enterprises, but instead of receiving a specific return, would be entitled to a proportion of the profits earned by the borrower, For the purpose of profit distribution, the

respective capital contribution of the parties concerned could be brought to a common basis by multiplying the amounts by the number of days during which each particular item, such as the equity capital of the firm, its cash reserves, financing provided by the bank and other sources, were actually employed in the business(16). In the limiting case where a bank provides all the capital, it would be the sole owner of the project.

Banks can either engage in direct lending, or can make loans indirectly through companies set up specifically to engage in *Mudarabah* financing(17). Risk capital for the *Mudarabah* company is provided by banks in the form of direct equity, or through loans with equity features, Banks receive *Mudarabah* certificates with a specific face value from the company, and these certificates can be traded between banks, The *Mudarabah* company, which can either be a specific-purpose company organized to finance a single project or type of activity, or a multipurpose company covering a variety of activities, is required to engage only in financial operations that are permitted under Islamic law, In all other respects the *Mudarabah* company would be subject to the rules and regulations applying to nonfinancial enterprises.

b. Musharakah financing

A complementary method to *Mudarabah* financing is a *Musharakah* transaction in which there is more than a single contributor of funds. All parties invest in varying proportions and the profits and losses are shared strictly in relation to their respective capital contributions.[*] The essential difference between the two forms of financing is the number of parties involved in the transaction, and indeed *Musharakah* financing corresponds closely to an equity market in which shares can be acquired by the public, banks, and even the central bank and the government.

Since the dividends from *Musharakah* claims will not be known in advance, and there is a possibility of a loss of the initial financial investment, this form of financing also satisfies the rules of Islamic law against interest. Firms desiring to raise funds for investment could use this mechanism and offer *Musharakah* certificates in the market. Such certificates would thus be in effect transferable corporate instruments secured by the assets of the company(18). Their price, and the implicit rate of return, would be determined through market forces.

C. Other modes of financing

The recommended methods of financing through *Mudarabah* or *Musharakah* contracts would tend to be most feasible in the case of large borrowers where the investment projects could be clearly identified and evaluated by the lender. There would be practical difficulties, however, in applying the strict profit and loss sharing approach to small-scale borrowers or for consumption loans(19). As such, a number of alternative instruments for investment and financing that are not expressly forbidden by Islamic law are available to banks. In the remainder of this subsection we discuss some of these.

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[*] This conforms to some schools: of Islamic law, but certain Schools do allow profits to be shared in proportions different from those in which capitals have been contributed. All schools are unanimous, however, regarding losses which must be shared in proportion with capital contributions, (Editor)

i. Deferred payment sale, or "mark up"

This method allows for the sale of a product on the basis of deferred payments either in installments or in a lump sum. The price of the product is agreed to between the buyer and seller at the time of the sale and cannot include any charges for deferring payments. Insofar as banking transactions are concerned, this method, known in Arabic terminology as *Bai Muajjal* or *Murabaha*, implies that the bank would purchase the product and resell it to the ultimate buyer, including in its price a profit margin or mark up. This mark up has to be negotiated with the buyer (borrower) and cannot be set unilaterally by the bank.

Because of its inherent simplicity the mark up method has become the most frequently used mode of financing in Islamic countries(20). However, it is considered to be a second-best method in comparison to profit sharing. For the mark up system to be consistent with Islamic law the transaction must satisfy two conditions. First, the financier has to take physical possession of the goods being financed for the borrower. This ensures that the lender is exposed to some measure of risk. Second, the rate of mark up should not be tied to the length of the period over which the financing is to be provided. This second condition means that there is an incentive to keep the maturity of the transaction fairly short.

ii. Purchase with deferred delivery

In this transaction, known as *Bai' Salam*, the buyer pays the seller the full negotiated price of a product which the seller agrees to deliver at a specified future date. Obviously the transaction would be limited to goods whose quality and quantity is known at the time of the contract. Because of this characteristic, this future delivery method is particularly suited to agricultural financing. Essentially the bank enters into an agreement with the farmer for the future purchase of agricultural products and makes the payment when the contract is determined. The assets of the farmer could be used as collateral for the loan as a guarantee against fraud or negligence, but any financial losses incurred in the operation would have to be fully borne by the lending bank.

iii. Leasing

A bank can purchase the product and lease it to the borrower for a specific sum and a specific period of time. The borrower can also negotiate for lease-purchase of the product, where the payments include a portion which can be applied towards the final purchase and transfer of ownership of the product. The bank, as in a normal leasing arrangement, can expect to receive payment for the cost of the product, as well as a share in the net rental value of the item, The risk also has to be shared between both parties in the event of any damage to the leased item(21). The leasing method can be particularly helpful to enterprises in the acquisition of capital equipment, as well as for loans to households for purchases of consumer durables.

iv, Service charges

Islamic law allows a lender to recover the costs of operation over and above the principal amount from the borrower. Thus, banks are legally able to impose a service charge or commission on the loans they make, as well as when they serve as trustees.

There is one important condition attached to such charges. To prevent the commission or service charge from becoming equivalent to interest, the amount of the service charge cannot be made proportional to the size of the loan. The maturity of the loans of this type would necessarily tend to be short and the main beneficiaries of the method of lending would generally be consumers and other small-scale borrowers.

3. Islamic banking, and the role of the central bank

Under the Islamic system, banking operations will undoubtedly be more varied and complex, as compared to the traditional banking system. In terms of profit sharing activities, the criterion of credit-worthiness of the borrower that underlies conventional banking systems will have to be changed to place more emphasis on the viability and profitability of the specific project being proposed. In addition to a term structure of rates of return, there will be a structure of returns for different economic activities that banks have to consider. Project evaluation and appraisal, determination of profit sharing ratios, and the establishment of a procedural framework for the processing, monitoring, supervision, and auditing of various projects will create new demands on commercial banks. On the liability side, banks would have to attract depositors on the basis of profits and dividends, rather than through interest rates. In short, commercial banks in an Islamic system would have to be transformed into institutions that would closely resemble investment banks in Western financial systems.

The monetary authorities operating in an Islamic framework would continue to have the power to regulate banking and financial operations in the economy to both allocate resources in conformity with the priorities of the society, as well as to direct monetary policy towards specific goals. To achieve its policy objectives, the central bank has control over the supply of high-powered money, the reserve ratios on the different types of liabilities, and the maximum amounts of assets which the banks can allocate to their profit sharing activities. A further opportunity for enhancement of the control over the banking system is available to the central bank through its purchases of equity shares of banks and other financial intermediaries. Through performance of its regulatory, supervisory, and control functions, as well as its lender-of-last-resort role, the central bank can continue to exert substantial influence on the financial system. Moreover, opportunities will exist for the central bank to invest directly in the real sector on a profit sharing basis, as well as to take equity positions in joint ventures along with other banks. The ability to buy and sell securities in the financial market, that is open-market operations, will still be available to the central bank as long as these securities do not have par value features and a non-zero coupon rate.

Additionally, the suggestion has been made that the central bank can regulate profit sharing ratios between the banks and borrowers on the one hand, and the banks and depositors on the other. Variations in these ratios will change the rates of return and could have the same impact as interest rates on the overall and sectoral flows of financial resources. There is, however, debate on whether such a policy is valid, since it represents a limitation on the freedom of contract and may be inequitable[22]. The issue of inequity would arise if the profit sharing rules imposed by the central bank required, say, a lower return from profits than the share in losses.

III
A Theoretical Model of the Islamic Financial System

In order to study the design and effects of monetary policy we develop a simple macroeconomic model that incorporates the principal characteristics of Islamic banking outlined in Section II. This model is basically a variant of the general equilibrium financial models of Brainard (1967), Tobin (1969), and Modigliani and Papademos (1980), that have become standard in monetary theory. Specific attention is paid to the financial relationships in this model, since, as argued by Modigliani and Papademos (1980), to properly analyze the role of monetary policy in affecting the actions of market participants, and the consequent effects on the spending behavior of firms and households, one has to employ a framework that takes explicitly into account the structure of financial markets. As will be shown, the model formulated here, despite its simplicity, is a useful representation of the basic Islamic financial system, and thus proves to be a convenient device for the study of monetary policy in an Islamic economy.

This Section discusses the basic accounting structure of the model, the underlying behavioral relationships, and finally, the effects of monetary policy.

1. Structure of the model

The financial side of the economy is assumed to be composed of commercial banks, which are the only financial intermediaries, the central bank, and the non bank public(23). In addition to financial assets, the model contains a single (composite) commodity that is both produced and consumed domestically. For simplicity, the economy is assumed to be closed so that there is no trade or capital movements.

a. Banking sector

Commercial banks are assumed to offer only investment deposits (Db) to the public which, as discussed in the previous section, are not guaranteed by the banks and do not yield a predetermined rate of return. At this level of abstraction the exclusion of transaction deposits does not materially affect the analysis. The banks are assumed to pay depositors a rate of return (r_b) that is based on profits from their operations. These profits are shared between the depositor and the bank in some mutually-agreed proportioned *determined prior to the transaction*, so that r_b is the depositor's share of the bank profits as a proportion of his deposit. In other words, if π represents distributable profits of banks, and λ is the share of the depositor, then

$$r_b = \frac{\lambda\pi}{Db} \quad \lambda > 0; \quad \pi >< 0$$

The rate of return received by deposits will thus fluctuate according to variations in bank profits and/or the stock of deposits. The profit-sharing ratio λ is assumed to remain fixed for the duration of the contract.

Unlike in the case of the traditional banking system, commercial banks in the Islamic system cannot borrow from the central bank through the customary mechanism of rediscounting at a given official discount rate. Any such borrowing has to be based on a profit and loss arrangement. We assume here that banks can borrow from the central bank only on an equity-participation basis. That is, the central bank purchases equity in the bank when it wishes to expand reserves in the system, and vice versa. Therefore, an additional source of funds for commercial banks becomes the sale of equity shares (Eb) to the central bank[24]. As in the case of investment deposits, the rate of return on equity shares (r_e) would depend on the overall profit position of banks, so that in contrast to an official discount rate, it would not be determined directly by the central bank.

On the lending side banks engage in only risk-return sharing *Mudarabah* arrangements with the public. *Mudarabah* financing (F_b) in this case is assumed to subsume all other types of similar arrangements, such as *Musharakab* financing[25]. As in the case of investment deposits, the profits earned from the projects financed by the bank (π) are shared between the bank and the entrepreneur on a prearranged basis specified in the contract between the two before the financing is provided. The rate of return the banks receive will be related to the rate they pay on their liabilities, with the spread essentially covering operating and other costs. If such costs are assumed to be zero, the rate of return on loans will be equal to rate of return on deposits. The banks would thus be receiving:

$$r = \frac{\gamma\pi}{Fb} \quad \gamma > 0; \qquad \pi >< 0$$

where γ is the profit-sharing ratio in favor of the bank[26]. The return to the borrower would correspondingly be equal to $(1 - \gamma)\pi$ Fb so that an increase in r_b, brought about by a higher γ would reduce the demand for loans.

Banks are also required to hold a certain proportion of their liabilities to the public (Db) in the form of reserves with the central bank (Rb). There has been discussion in the literature on Islamic banking as to whether investment deposits should be subject to legal reserve requirements or not (Khan (1986)). In the present case, however, we assume that banks hold reserves at the central bank without necessarily implying that such holdings are mandatory.

b. Central bank

The central bank's liabilities in this simplified system consist solely of reserves of commercial banks (Rc). Since there is no currency held by the public in the model, high-powered money in the economy is definitionally equal to the stock of bank reserves. On the asset side the central bank holds equity shares of commercial banks (Ec), and the rate of return (r_e) on these is market determined. The supply of reserves is changed by the central bank through variations in its stock of bank equity shares ($\Delta Ec = \Delta Rc$), which in turn alters the cost of borrowing for the banks.

C. Public sector

Since commercial banks are the only financial intermediaries in the economy, investment deposits in the banking system represent the financial wealth of the public. Total wealth of the public is, thus, equal to financial wealth and its stock of capital (K) [27]. The public has basically two sources of funds: first, *Mudarabah* financing obtained from banks (F_P), and second, its own savings (S). In the absence of a debt market, any desired increase in assets (financial or total) has to be accommodated through one of these sources.

The basic structure of the model that we have described above can be conveniently summarized in the following flow of funds accounts:

Table 1. Flow of Funds Accounts of the Islamic Financial System.

	Public		**Banks**		**Central Bank**	
	Uses	**Sources**	**Uses**	**Sources**	**Uses**	**Sources**
Investment deposits	ΔDp			ΔDb		
Mudarabah credit		ΔFp	ΔFb			
Equity of banks				ΔEb	ΔEc	
Reserves			ΔRb			ΔRc
Investment	I					
Savings		S				

While Table 1, which defines the aggregate budget constraint of the economy[28], is a very simple representation, it does nevertheless point out the main accounting relationships that can be expected to exist in an Islamic economy. Any model that attempts to explain this type of economy would have to necessarily ensure consistency with the flow of funds accounts.

2. Behavioral relationships

The particular model that we utilize in the study of monetary policy in an Islamic economy is a variant of the standard IS-LM model. While relatively simple in structure the model developed is sufficiently general to incorporate the balance sheet restrictions outlined in Table 1.

In specifying this macroeconomic model we make three important assumptions. First, there is no attempt at an explicit price-output breakdown in the determination of national income. If prices are assumed to be fixed, as would be the case if a strict version of Keynesian model was employed, then all changes in income will reflect variations in real output. Here no distinction between nominal and real changes in income is considered as it is not essential to the argument. Second, the model does not feature any role for expectations. In other words, we assume here that expectations of economic agents are fully realized. Finally, the economy and the financial sector are assumed to be in continuous equilibrium and the analysis is essentially comparative static in nature[29]. Each economic variable is, thus, defined as a deviation from its respective equilibrium value[30].

The real side of the economy is represented by a function relating the excess of investment over savings to the rate of return on bank (*Mudarabah*) financing, the level of national income, and total net wealth of the public:

(1) $(I - S) = - a_1 r_b - a_2 Y + a_3 W - 1$

where,

I = investment;

S = savings;

r_b = rate of return on bank financing;[31]

Y = national income, and,

W_{-1} = total net wealth of the public, defined as K + Dp, at the beginning of the period.

Equation (1) will be recognized as being simply an IS relationship, derived assuming that investment is a negative function of the rate of return on *Mudarabah* financing, and savings a positive function of income, Net wealth at the beginning of the period is assumed to affect both investment and savings, with the former effect dominating[32]. Given the underlying relationships all the parameters in equation (1) are written to be positive.

The derivation of the LM part of the model is somewhat more complicated, since in contrast to the real sector where there was a single commodity, there are three financial assets in the model: bank loans, investment deposits, and equity shares of commercial banks. Starting with the loan market, the public's demand for *Mudarabah* financing is specified as a function of the banks' required rate of return, and net wealth at the beginning of the period:

(2) $\Delta Fp = f_1 rb + f_2 W - l$

The banking sector's supply of *Mudarabah* financing can be specified as a positive function of the rate of return, and a negative function of the cost of borrowing for banks. This cost will be effectively the rate of return on the banks equity shares held by the central bank (r_e). The sale and repurchase of its equity is the only way a bank is assumed to be able to augment or reduce its resources. This operation, as pointed out earlier, is equivalent to the use of a rediscounting mechanism, where r_e is the quasi discount rate. The supply equation has the form:

(3) $\Delta Fb = s_1 rb - s_2 re$

Changes in the public's demand for investment deposits are derived from the balance sheet constraint:

(4) $\Delta Dp = \Delta Fp - (I - S)$

Substituting equations (1) and (2) into equation (4). we obtain:

(5) $\Delta Dp = - (f_1 - a_1)\ rb + a_2 Y + (f_3 - a_3)\ W - 1$

The reserves of the banking system are given by the following definition:

(6) $\Delta Rb = k\Delta Dp$

where k is the reserve ratio.

If the banking system passively meets the demand for deposits, $\Delta Db = \Delta Dp$, we are left with the following four markets:

(7) $(I - S) + (\Delta Fb - \Delta Fp) + (\Delta Rb - \Delta Rc) + (\Delta Ec - \Delta Eb) \equiv 0$

We can, thus, take advantage of Walras Law to eliminate any one market, and here we have chosen to drop the equity shares market, $(\Delta Ec - \Delta Eb)$.

As mentioned earlier, the central bank adjusts the supply of reserves to the system by varying its holdings of equity shares of banks:

(8) $\Delta Rc = \Delta Ec$

Given that the equity shares market is determined through (7), the equilibrium conditions of the model, that is,

(9) $\Delta Fp = \Delta Fb$

(10) $\Delta Rc = \Delta Rb$

(11) $I = S$

allow us to solve for the three endogenous variables, namely the rates of return on *Mudarabah* financing (r_b) and equity shares (r_e), and the level of national income (Y). Using these equilibrium conditions, the system of equations can be written as:

(12) $-(f_1 + s_1)r_b + s_2re = f_1W_{-1}$

(13) $-k(f_1 - a_1)\, r_b + t\, ka_2Y - \Delta Rc = -k(f_2 - a_3)W_{-1}$

(14) $a_lr_b - a_2Y = a_3W_{-1}$

The system is closed by specifying an equation for the intermediate target for monetary policy, which then allows ΔRc to be determined.

3. Solution of the model

We can now solve the model for two specific types of monetary policy. In the first, we assume the authorities wish to control the money supply itself, and following this consider an alternative case where ceilings are placed on *Mudarabah* financing.

If the intermediate target of monetary policy is the total money supply, which in turn is achieved by variations in the reserves of banks (Rc), the fourth equation in the model becomes:

(15) $-(f_1 - a_1)r_b + a_2Y = \Delta M - (f_2 - a_3)W_{-1}$

where ΔM is the change in the money supply, and as there is no currency in the hands of the public, $\Delta M = \Delta Dp$. Equation (15) is taken directly from equation (5), and basically says that the authorities adjust the supply of money to meet demand. Solving the system of equations (12)-(15) we obtain the equilibrium values of r_b, r_e, Y, and Rc.[(33)] These are:

(16) $$r_b^* = \frac{f_2}{f_1}W_{-1} - \frac{1}{f_1}\Delta M$$

(17) $$r_e^* = \frac{s_1 f_2}{s_2 f_1}W_{-1} - \frac{(f_1 + s_1)}{s_2 f_1}\Delta M$$

(18) $$Y^* = \frac{(a_3 f_1 - a_1 f_2)}{a_2 f_1}W_{-1} + \frac{a_1}{a_2 f_1}\Delta M$$

(19) $\Delta Rc^* = k\Delta M$

Given the assumed signs of the relevant parameters, an increase in the rate of monetary expansion will lower the rates of return on financial assets, and will raise the level of national income. This corresponds to the result obtained in the familiar IS-LM model when there is an outward shift in the LM curve.

Suppose the central bank, instead of choosing to target the overall money supply, decides to use *Mudarabah* financing (ΔFb) as the operative variable and again adjusts (ΔRc) to achieve its target. In this case the central bank would have to ensure that the supply of *Mudarabah* financing is equated to the demand. Equation (15) would, therefore, be replaced by equation (3) as follows:

(15a) $-s_1 rb + s_2 r_c = \Delta Fb$

The equilibrium values of r_b, r_e. Y, and ΔRc, from equations (12), (13), (14). and (15a) would be:

(20) $$r_b^* = \frac{f_2}{f_1}W_{-1} - \frac{1}{f_1}\Delta Fb$$

(21) $$r_e^* = \frac{s_1 f_2}{s_2 f_1}W_{-1} - \frac{(f_1 + s_1)}{s_2 f_1}\Delta Fb$$

(22) $$Y^* = \frac{(a_3 f_1 - a_1 f_2)}{a_2 f_1}W_{-1} + \frac{a_1}{a_2 f_1}\Delta Fb$$

(23) $\Delta Rc^* = k\Delta Fb$

The solutions of the model clearly show that it is a matter of indifference as to whether the authorities attempt to influence monetary conditions through changing the money supply, or use the flow of *Mudarabah* financing as an intermediate objective. Both types of monetary policy measures yield identical effects on the financial rates of return in the system, and on the level of national income. Indeed, this is what one would expect to observe in a closed economy, where there is no economic difference whether the monetary authorities choose to focus on the liability or asset side of the balance sheet of the banking system. What is more important is that exactly the same solutions would have been obtained if one was working with a traditional financial system with a predetermined rate of interest on deposits. As long as lending rates are fully flexible, the two systems turn out to be formally equivalent from the standpoint of monetary policy. This result, while obtained for a closed economy, also carries over to the more realistic case where trade in goods and financial claims is possible. As is well known, in an open economy with a fixed exchange rate, the money supply can no longer be treated as an exogenous policy instrument as variations in it can be brought about through balance of payments surpluses and deficits. Consequently, it is the domestic component of the money stock. i.e., domestic credit, that becomes the relevant instrument of policy. In the Islamic system *Mudarabah* credit is the counterpart to domestic credit, and accordingly can be used in the same manner to alter domestic financial conditions to achieve the desired results on macroeconomic variables in an open economy.

IV
Conclusions

The establishment of an economic system based on Islamic values requires fundamental changes in the operations of financial institutions. Since interest rates are not allowed, alternative mechanisms that rely primarily on a notion of profit sharing or equity participation have had to be developed to replace the system of interest-based transactions. The purpose of this paper was to describe some of these alternative methods of conducting financial transactions in an Islamic economy, and then to analyze the role of monetary policy in such an environment.

In very broad terms, the use of profit-sharing arrangements in place of interest rates makes commercial banks in an Islamic economy more akin to investment banks. Depositors receive a share of the profits made by the bank, rather than a predetermined rate of interest and banks in turn receive a rate of return based on profits made by the borrower. At the simplest level, the Islamic financial system replaces debt financing by equity financing, and predetermined rates of return by returns that are a direct function of profits. Of course, this transformation requires the creation of a variety of financial institutions, and instruments that have the profit-sharing characteristics, and in this paper we discussed a number of those proposed in the literature.

To obtain a better understanding of how the Islamic financial system would function, and how it would interact with the real side of the economy, we developed a simple macroeconomic model that explicitly incorporated the main elements of an Islamic system. This model, which is really only a generalization of the standard IS-LM model, yields some useful insights on the determination of financial rates of return in the economy and how monetary policy is conducted. The principal conclusion to

emerge from the analysis is that there is apparently no fundamental change in the way monetary policy affects economic variables in an Islamic economy. The authorities can achieve the very same results through controlling the supply of profit based bank lending as they can through variations in the total money supply. While institutions and financial instruments may be quite different in an Islamic economy, the standard macroeconomic result, namely that an expansionary monetary policy would reduce rates of return and increase output in the short run, carries through. What the authorities do lose in the process is the ability to directly set financial rates of return. Such practices are fairly commonplace in developing countries, and in one sense the financial system is more market oriented in an Islamic economy.

There are, of course, a number of limitations associated with the model utilized in this paper so that the analysis should be viewed only as suggestive. A more realistic model would have to take into account at least the following: first, the effects of uncertainty created by the elimination of a predetermined interest rate on the basic behavioral relationships. Second, the role of expectations, particularly as economic decisions in an Islamic financial system rely heavily on the expected rates of return and expected profits. In the present model this issue was sidestepped by assuming that expectations were fully realized. Third, the model would have to allow for some sort of dynamic behavior to understand how the system would move out of equilibrium. Finally, it would be necessary to allow for an explicit role for the government in order to see how its actions would effect the real sector, and through the financing of fiscal deficits, monetary conditions in the economy. Such issues are admittedly quite difficult to handle analytically, but have to be addressed to gain a proper understanding of the workings of the Islamic financial system.

In conclusion, policymakers in Islamic countries face a number of difficult problems as they move towards transforming their economies to accord with religious principles. There are many macroeconomic issues that are as yet unresolved. These include, among others, the respective roles of monetary and fiscal policies, exchange rate policies, and the effects of changes in the system on savings and investment, and thereby on growth and development. During the transition many seemingly *ad hoc* and second-best policies have been adopted, but this is only to be expected as Islamization of the economy involves a learning process. How the Islamic financial system will look like when it achieves all the objectives should not be judged from the current practices of Islamic banking in certain countries. Considerably more theoretical analysis and actual experimentation is required to reconcile the rules and codes of economic behavior that have evolved over fourteen hundred years with the functioning of a modern-day economy. That so much progress has been achieved already in implementing Islamic values and ideals in the economic sphere is a tribute to scholars and policymakers. However, economists still have much to contribute concerning the directions that the Islamization of economies takes.

Notes

(1) Useful descriptions of Islamic banking are contained in Ahmad (1984), Karsten (1982), and Pryor (1985).

(2) In Iran and Pakistan all banks are now legally prohibited from engaging in interest-based transactions; in other Countries interest-free banks co-exist with conventional banks. For a discussion of the growth of Islamic banking, see Fahim Khan (1983).

(3) A sampling of writings on the subject include, among others, Ahmad (1952), Kahf (1978), Ahmad (1984), and the papers in Ahmad *etal.* (1983).

(4) See, for example, Siddiqi (1982), Kahf (1982), Chapra (1982), Khan (1982), Uzair (1982), and Ahmad (1984).

(5) For a discussion of this issue, see Ahmad (1984).

(6) Other services would presumably include the transfer of funds, foreign exchange facilities, the issue of bank drafts and letters of credit, and share brokerage.

(7) See Khan (1986).

(8) Any losses incurred by a bank would not affect its transaction deposit liabilities as these would be fully covered.

(9) Even in cases where there is no official deposit insurance scheme, the government is likely to step in to compensate depositors when a bank faces a crisis and potential bankruptcy.

(10) For a discussion of the type of formula that could be used, see Ahmad (1984).

(11) This does not imply that the return on investment deposits will be constant, since profits will normally fluctuate.

(12) These are basically variants of the system advocated by Henry Simons (1945) in connection with the banking crisis of the 1930s. A similar proposal has been made more recently by Kareken (1985).

(13) For a formal analysis of the process, see Khan (1986).

(14) As shown by Ahmad (1984), these types of transactions can be strongly defended on religious grounds, and there is no dispute among scholars on their consistency with Islamic law. There is less certainty regarding the other forms of financing discussed later.

(15) This arrangement, therefore, effectively places human capital on par with financial capital.

(16) This method of converting to a daily product basis is suggested by Ahmad (1984).

(17) Such companies have been established in Pakistan.

(18) The "participation term certificate" instituted in Pakistan since 1981 is one example of such instruments.

(19) Some Muslim scholars argue that short-term consumption loans should be made by banks to needy borrowers on an interest-free basis, presumably using the resources obtained from transaction deposits. As not all borrowers can be classified as "needy", and it is unlikely that the resources from transaction deposits would be sufficient to meet demand, alternatives to profit sharing must be developed.

(20) The mark up method is also employed in financing foreign trade by the Islamic Development Bank in Jeddah. In Pakistan this technique has been used for bank financing of commodity operations of the government and public sector agencies.

(21) Assuming, of course, that the item has not been insured by a third party.

(22) See Ahmad (1984).

(23) The government does not appear explicitly in the model. One can either assume that the government is part of the public or the central bank.

(24) It is assumed for simplicity that the public cannot participate in this market.

(25) Financing schemes involving mark up, deferred delivery, or leasing, as discussed in Section II, are not considered.

(26) Since Db = Fb this definition of r_b implicitly assumes that $\gamma = \lambda$.

(27) Changes in the stock of capital would be equal to investment, i.e., $\Delta K = I$.

(28) This budget constraint is given by:

$$(\Delta Dp + I - \Delta Fp - S) + (\Delta Fb + \Delta Rb - \Delta Db - \Delta Eb) + (\Delta Ec - \Delta Rc) \equiv 0.$$

(29) A dynamic version of this basic model is presented in Khan (1985).

(30) As the behavioral equations in the model are assumed to be linear, this assumption allows us to drop the constant terms.

(31) Recall that the rate of return on bank loans is equal to the rate of return on investment deposits.

(32) Strictly speaking, the sign of the parameter a_3 is ambiguous, but this assumption does not affect the analysis.

(33) Even with this simple system of four equations the analytical solutions are quite difficult and time consuming to obtain. Any increase in the number of equations to take in account other financial as sets would probably make the system impossible to solve.

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النظام المالي والسياسة النقدية في اقتصاد إسلامي

محسن س. خان و عباس ميراخور
المدير المساعد لقسم البحوث
والخبير الاقتصادي في قسم البحوث
صندوق النقد الدولي – واشنطن

المستخلص: يعين البحث الخصائص الرئيسية لنظام مالي إسلامي بالاعتماد على الكتابات المعاصرة وعلى التجربة الحديثة في الأعمال المصرفية الإسلامية. ثم يصوغ نموذجًا نظريًا لنظام اقتصادي إسلامي، من خلال تعميم النموذج التقليدي (IS - LM)، بهدف دراسة آثار السياسة النقدية على المتغيرات الاقتصادية الكلية في اقتصاد إسلامي. وقد انتهى إلى أنه ليس ثمة اختلاف جوهري في الطريقة التي تؤثر بها السياسة النقدية على المتغيرات الكلية، سواء ألجأت السلطات النقدية إلى التأثير على الأوضاع النقدية من خلال تغيير عرض النقود، أم باستخدام تدفق التمويل بالمضاربة (القراض) كهدف متوسط. وخلص البحث إلى أن إتباع سياسة نقدية توسعية ينتظر أن يخفض معدلات العائد ويزيد مستوى الإنتاج.